

# EXHIBIT E

*Sioux Steel Company v.  
KC Engineering, P.C.*

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Chad Kramer, PE  
September 29, 2016



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<p>1 chosen for.</p> <p>2 Q Is there a particular computer program outside of Excel</p> <p>3 that helps you do this, or is your Excel set up to</p> <p>4 essentially produce this mathematical calculation on</p> <p>5 page 1376?</p> <p>6 A I'm not sure I understand your question.</p> <p>7 Q Well, how does all the information, all the math on</p> <p>8 page 1376 -- I mean how does that get there? I'm</p> <p>9 assuming you have to input some information.</p> <p>10 A Yes.</p> <p>11 Q And then is the Excel just doing the math for you?</p> <p>12 A Yes.</p> <p>13 Q And is the information that you're inputting, is that</p> <p>14 the stuff below the table -- or above the table and</p> <p>15 below the "Hopper Panel Vertical Splices" heading?</p> <p>16 A Yes.</p> <p>17 Q At the far right there's the utility ratio?</p> <p>18 A Utilization ratio.</p> <p>19 Q Utilization ratio. Thank you.</p> <p>20 What does that tell someone like yourself? What</p> <p>21 do those ratios mean?</p> <p>22 A It tells you how much the -- how much of the allowable</p> <p>23 capacity is utilized.</p> <p>24 Q Okay. And it's my understanding that we want to be</p> <p>25 below 1; is that correct?</p>	<p>1 problem?</p> <p>2 A Yes.</p> <p>3 Q So you would have seen that we have a problem at the</p> <p>4 28-foot diameter --</p> <p>5 A Yes.</p> <p>6 Q -- and also at the 15-foot diameter?</p> <p>7 A Yes.</p> <p>8 Q In fact, at the 28-foot diameter we have a very big</p> <p>9 problem, correct?</p> <p>10 A The ratio is over 1, yes.</p> <p>11 Q I mean it's -- I don't want to parse words with you,</p> <p>12 but we are -- we're almost up to 4.</p> <p>13 A Yes.</p> <p>14 Q What did you then do, if anything, after you saw those</p> <p>15 numbers to change your design in any way?</p> <p>16 A We didn't know that these numbers were at those levels</p> <p>17 until post failure, and at that time we made design</p> <p>18 changes.</p> <p>19 Q So -- okay. You never saw or appreciated these numbers</p> <p>20 pre-failure?</p> <p>21 A I did not.</p> <p>22 Q Was that a mistake on your part? I mean you should</p> <p>23 have realized these numbers pre-failure?</p> <p>24 Let me start over.</p> <p>25 The bin that was manufactured and shipped down to</p>
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<p>1 A Yes.</p> <p>2 Q So, for example, at the 28-foot diameter it's my</p> <p>3 understanding that those vertical seams would be</p> <p>4 overstressed by 389 percent.</p> <p>5 Is that how you would read that?</p> <p>6 A Yes.</p> <p>7 Q And then at 15 feet those vertical seams are</p> <p>8 overstressed by 152 percent?</p> <p>9 A They would be overstressed by 52 percent.</p> <p>10 Q And at 4 foot, we're below 1, so that would be a number</p> <p>11 that -- that we would like to see?</p> <p>12 A Yes.</p> <p>13 Q As a design engineer -- all three of those utilization</p> <p>14 ratios should be below 1, correct?</p> <p>15 A Yes.</p> <p>16 Q What did you do when you saw that at the 28-foot</p> <p>17 diameter and the 15-foot diameter we are above 1?</p> <p>18 A I'm not sure what exactly you're asking.</p> <p>19 Q Well, I'm assuming that when you did the design, you</p> <p>20 referenced and referred to this page --</p> <p>21 A Yes.</p> <p>22 Q -- 1376?</p> <p>23 A Yes.</p> <p>24 Q And as I understand it, if you see utilization ratios</p> <p>25 that are over 1, that's a signal that there's a</p>	<p>1 Mexico and that failed --</p> <p>2 A Yes.</p> <p>3 Q -- it went out per the design in Exhibit 5?</p> <p>4 A Yes.</p> <p>5 Q And it would have had utilization ratios at the 28-foot</p> <p>6 and the 15-foot diameter that are problems?</p> <p>7 A Yes.</p> <p>8 Q And you'll agree with me that the hopper bin should not</p> <p>9 have gone down to Mexico with utilization ratios at</p> <p>10 those seams of 3.89 and 1.52?</p> <p>11 A Yes. There was a math error. Yes.</p> <p>12 Q And maybe I'm just trying to be too diplomatic, and</p> <p>13 maybe that's part of our disconnect here. But, I mean,</p> <p>14 a mistake was made by Sioux Steel in the design of this</p> <p>15 bin, correct?</p> <p>16 A Yes. I made a mistake, yes.</p> <p>17 Q And that mistake is yours?</p> <p>18 A Yes.</p> <p>19 Q Post failure you said you made some changes. What</p> <p>20 changes were made to account for these design errors?</p> <p>21 A We modified the hopper panels, changed the bolt</p> <p>22 spacing, the edge distances from the edge of the</p> <p>23 material to the edge of the bolts, increased that.</p> <p>24 Q Is it still just one row of bolts, or are there more</p> <p>25 rows now?</p>

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<p>1 A We don't have that software, no.</p> <p>2 Q So when you did your design, you didn't have the</p> <p>3 benefit of the RISA model?</p> <p>4 A No.</p> <p>5 Q Within the scope -- or below the scope, KC Engineering</p> <p>6 lists out some standards that they are going to use or</p> <p>7 reference in their review.</p> <p>8 Did you have any concern at the time in July of</p> <p>9 2012 about any of those particular references or</p> <p>10 standards?</p> <p>11 A No.</p> <p>12 Q In fact, if I remember correctly, they're probably some</p> <p>13 of the same that you already told me that you were</p> <p>14 using when you did your design?</p> <p>15 A Yes.</p> <p>16 Q As you sit here today, do you have any problem with</p> <p>17 those four referenced standards?</p> <p>18 A I do not.</p> <p>19 Q And maybe I already asked this -- and if I did forgive</p> <p>20 me -- but you told me that no calculations were sent to</p> <p>21 KC Engineering, correct?</p> <p>22 A Correct.</p> <p>23 Q And why was that? Why were no calculations sent to</p> <p>24 KC Engineering?</p> <p>25 MR. GOODSSELL: I'm going to object to the</p>	<p>1 A Yes.</p> <p>2 Q Who is Tim?</p> <p>3 A Tim is an R&amp;D lab technician.</p> <p>4 Q At that time was Tim a Sioux Steel employee?</p> <p>5 A Yes.</p> <p>6 Q And then the other name is Chuck. Who is Chuck?</p> <p>7 A Chuck is part of operations and does bills of</p> <p>8 materials.</p> <p>9 Q And obviously he would have been a Sioux Steel employee</p> <p>10 at the time as well?</p> <p>11 A Yes.</p> <p>12 Q Are those three gentlemen still with Sioux Steel today?</p> <p>13 A Yes.</p> <p>14 Q Did any -- from previous answers I think I know that</p> <p>15 the answer is no, but those gentlemen would not have</p> <p>16 played any role in the design -- in your design of the</p> <p>17 hopper bin at issue?</p> <p>18 A No.</p> <p>19 Q It appears to me from these engineering reports that in</p> <p>20 the summer of 2012 -- and now we're into August per</p> <p>21 this engineering report -- that Sioux Steel is going</p> <p>22 forward with the actual manufacture of these hopper</p> <p>23 bins. Is that accurate?</p> <p>24 A We are preparing for the manufacture of the hopper</p> <p>25 bins, yes.</p>
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<p>1 question. It's been asked and answered.</p> <p>2 You can go ahead.</p> <p>3 THE WITNESS: I don't know why the calculations</p> <p>4 weren't sent. They weren't asked for. We weren't</p> <p>5 asked to provide calculations.</p> <p>6 (Exhibit 8 is marked for identification.)</p> <p>7 BY MR. TOBIN:</p> <p>8 Q Chad, I'm going to hand you what's been marked as</p> <p>9 Exhibit 8, and Exhibit 8 is another weekly engineering</p> <p>10 report from you to Chris Nelson, correct?</p> <p>11 A Yes.</p> <p>12 Q And this one is from August 10 of 2012?</p> <p>13 A Yes.</p> <p>14 Q On the second page under the hopper bins you note that</p> <p>15 KC Engineering is in the process of their design</p> <p>16 review?</p> <p>17 A Yes.</p> <p>18 Q And then you note some work that's being done, and I</p> <p>19 just want to have a quick discussion about that.</p> <p>20 The first name you reference is Gary. Who is</p> <p>21 Gary?</p> <p>22 A Gary is a designer or drafter.</p> <p>23 Q Was he at this time a Sioux Steel employee?</p> <p>24 A Yes.</p> <p>25 Q And then the next name is Tim?</p>	<p>1 Q What do you mean by you're preparing for the</p> <p>2 manufacture of the hopper bins?</p> <p>3 A Creating weld fixtures for operations to use.</p> <p>4 Q To your knowledge had any bins -- exemplar bins of any</p> <p>5 type been manufactured and produced during -- by or in</p> <p>6 August of 2012?</p> <p>7 A I'm sorry. What type of bins?</p> <p>8 Q The hopper bins at issue, any sort of exemplar or any</p> <p>9 other type of hopper bins, had any been produced?</p> <p>10 A No.</p> <p>11 Q I guess what I'm driving at is -- and see if you agree</p> <p>12 with this or not: Sioux Steel was going forward with</p> <p>13 the manufacture of these bins and almost were not</p> <p>14 waiting necessarily for what KC Engineering has to say?</p> <p>15 A We were going down parallel paths of being prepared to</p> <p>16 manufacture.</p> <p>17 (Exhibit 9 is marked for identification.)</p> <p>18 MR. TOBIN: Why don't we take a short break if</p> <p>19 that's okay.</p> <p>20 MR. GOODSSELL: Sure.</p> <p>21 (Recess taken from 9:59 a.m. to 10:14 a.m.)</p> <p>22 BY MR. TOBIN:</p> <p>23 Q Before we turn to Exhibit 9, I just want to circle back</p> <p>24 to a few issues.</p> <p>25 The calculations. We were discussing</p>

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<p style="text-align: right;">Page 45</p> <p>1 <u>Exhibit 9?</u></p> <p>2 A We did.</p> <p>3 Q And then after the table of contents from the RISA</p> <p>4 model, there are 26 additional pages, and I'm going to</p> <p>5 call them the KC Engineering working papers or design</p> <p>6 papers. And you would have received those 26 pages as</p> <p>7 well when you received their report?</p> <p>8 A Yes.</p> <p>9 Q So it's a long way of saying: On or about August 28</p> <p>10 you received from KC Engineering their two-page letter</p> <p>11 report, the very thick RISA printout, as well as</p> <p>12 26 pages of KC Engineering's working papers?</p> <p>13 A Yes.</p> <p>14 Q Okay. When you received their report, did you read it?</p> <p>15 A Yes.</p> <p>16 Q What, if anything, did you do with the RISA printout?</p> <p>17 A Not really -- there's not much you can do with a model.</p> <p>18 I mean there's a lot of pages that you didn't really --</p> <p>19 I couldn't really do a whole lot with.</p> <p>20 Q And it's my understanding that the RISA model would say</p> <p>21 nothing about the vertical panel sections that we're</p> <p>22 here to talk about for this hopper cone.</p> <p>23 Do you agree with that?</p> <p>24 A The models don't have any of the bolted joint</p> <p>25 connection design.</p>	<p style="text-align: right;">Page 47</p> <p>1 A I would agree with that, yes.</p> <p>2 Q And we can look specifically -- if I can find it quick.</p> <p>3 It's toward the back. The lawyer number is</p> <p>4 Plaintiff 28, and the handwritten KC Engineering number</p> <p>5 is 22.</p> <p>6 On this page you'll agree with me that</p> <p>7 KC Engineering did a review of the horizontal seam for</p> <p>8 the horizontal connection?</p> <p>9 A Yes.</p> <p>10 Q And as we talked earlier, that would encompass the</p> <p>11 three rows of bolts at the top of the panel?</p> <p>12 A Yes.</p> <p>13 Q And it's plain that there is no review of the vertical</p> <p>14 seam, correct?</p> <p>15 A Yes.</p> <p>16 Q Do you recall when you received this report in August,</p> <p>17 late August of 2012, noting that there was no review of</p> <p>18 the vertical seam?</p> <p>19 A I did not know that at the time, no.</p> <p>20 Q You'll agree with me, though, that KC Engineering</p> <p>21 provided information to you showing which seams they</p> <p>22 did and did not review?</p> <p>23 A The calculations on the page you're talking about</p> <p>24 reference the horizontal seam.</p> <p>25 Q And you'll agree with me that if you had reviewed those</p>
<p style="text-align: right;">Page 46</p> <p>1 Q So can we agree that the RISA report really doesn't</p> <p>2 have anything to do with what we're here to talk about</p> <p>3 today?</p> <p>4 A Not necessarily. The RISA model is going to have</p> <p>5 stresses in it that would be used for what we're</p> <p>6 talking about today.</p> <p>7 Q Okay. All right. But it doesn't speak to the vertical</p> <p>8 seams, that we'll talk about later, the vertical seams</p> <p>9 where it ultimately failed on this hopper bin when it</p> <p>10 collapsed -- or when the material came out of it,</p> <p>11 I should say.</p> <p>12 A Yes.</p> <p>13 Q Okay. And the RISA report wouldn't talk about those</p> <p>14 bolted connections?</p> <p>15 A It would not.</p> <p>16 Q Okay. The 26 pages that KC Engineering included from</p> <p>17 their file, did you review those when you received the</p> <p>18 report?</p> <p>19 A Not in depth, no.</p> <p>20 Q Since the failure at issue up until today have you had</p> <p>21 a chance to go through those 26 pages in detail?</p> <p>22 A Yes.</p> <p>23 Q Will you agree with me that nowhere in those 26 pages</p> <p>24 does KC Engineering do any review of those vertical</p> <p>25 seams?</p>	<p style="text-align: right;">Page 48</p> <p>1 26 pages thoroughly and carefully, you would have seen</p> <p>2 and recognized that there was no design review of the</p> <p>3 vertical seam?</p> <p>4 MR. GOODSSELL: I'm going to object to the form and</p> <p>5 foundation of the question.</p> <p>6 You can go ahead and answer.</p> <p>7 THE WITNESS: Honestly I focused on the</p> <p>8 conclusions of their report and focused on the areas</p> <p>9 that they said needed to be addressed.</p> <p>10 You know, we did our design and sent it to KC to</p> <p>11 be vetted and, you know, assumed that they were going</p> <p>12 to check the entire design of the hopper.</p> <p>13 BY MR. TOBIN:</p> <p>14 Q Now, in their report on <u>Exhibit 9</u> they do identify one</p> <p>15 issue with the 30-foot diameter hopper, correct?</p> <p>16 A Yes.</p> <p>17 Q And it's my understanding that that concern has to do</p> <p>18 with the legs of the hopper bin structure and not</p> <p>19 anything to do with the cone?</p> <p>20 A Yes.</p> <p>21 Q And then in a follow-up report between you and</p> <p>22 KC Engineering, the issue with the legs, that issue was</p> <p>23 resolved to the mutual satisfaction of yourself and</p> <p>24 KC Engineering?</p> <p>25 A Yes. We responded that we didn't agree with their --</p>

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<p style="text-align: right;">Page 49</p> <p>1 with the report, and we ultimately came to a conclusion</p> <p>2 that the legs were indeed okay.</p> <p>3 Q At no time did you ever specifically address with</p> <p>4 KC Engineering anything -- let me back up.</p> <p>5 At no time did you specifically address those</p> <p>6 vertical seams with KC Engineering, correct?</p> <p>7 A We did not.</p> <p>8 Q And at the time KC Engineering did its review, it did</p> <p>9 not have your working file, <u>Exhibit 5</u>, correct?</p> <p>10 MR. GOODSSELL: Object to the form of the question.</p> <p>11 You can go ahead and answer.</p> <p>12 THE WITNESS: Correct.</p> <p>13 BY MR. TOBIN:</p> <p>14 Q I'm going to hand you what was marked as <u>Exhibit 4</u> from</p> <p>15 yesterday. <u>Exhibit 4</u> is a series of e-mails. I think</p> <p>16 the first one is actually on the third page.</p> <p>17 If you want to take a few minutes and go ahead and</p> <p>18 review that, then we'll have some questions about it.</p> <p>19 (Pause in the proceedings.)</p> <p>20 Have you reviewed <u>Exhibit 4</u>?</p> <p>21 A Yes.</p> <p>22 Q We're going to start on the third page. This e-mail</p> <p>23 string starts with an e-mail from Les Garcia to you</p> <p>24 about some questions he had about some air cannons,</p> <p>25 correct?</p>	<p style="text-align: right;">Page 51</p> <p>1 sold and installed down in Mexico, correct?</p> <p>2 A Correct.</p> <p>3 Q And my question is maybe one you don't have an answer</p> <p>4 for, but how could a bin be sold by Sioux Steel where</p> <p>5 you're having this add-on equipment and engineering</p> <p>6 isn't going to be consulted?</p> <p>7 A Engineering is responsible for the structural design.</p> <p>8 Accessories on our bins, you know, that sales deals</p> <p>9 with, you know, sales will do that, and engineering</p> <p>10 won't be involved with the sale of accessories for</p> <p>11 bins.</p> <p>12 Q So it was not a surprise to you that sales is selling a</p> <p>13 product and they're putting some accessories to it</p> <p>14 without consulting with you first?</p> <p>15 A Can you repeat that question?</p> <p>16 Q Sure. It was not a surprise to you that sales is</p> <p>17 selling a product and they're adding some accessories</p> <p>18 to it without consulting with you first?</p> <p>19 A We wouldn't necessarily know what accessories are being</p> <p>20 sold with the bin.</p> <p>21 Q Correct. And I guess what I'm trying to get to is if</p> <p>22 sales is going to include some accessories with a</p> <p>23 product, it's not normal for that to be run through</p> <p>24 engineering first?</p> <p>25 A Correct.</p>
<p style="text-align: right;">Page 50</p> <p>1 A Yes.</p> <p>2 Q And you respond to Les, and you let him know that</p> <p>3 you've never dealt with air cannons, correct?</p> <p>4 A Yes.</p> <p>5 Q We know at this point in time in late July of 2014 that</p> <p>6 the bin that ultimately fails, it has already been</p> <p>7 purchased and is being shipped and may even be in</p> <p>8 operation down in Mexico, correct?</p> <p>9 MR. GOODSSELL: I'm going to object to the form and</p> <p>10 the foundation of the question.</p> <p>11 You can go ahead and answer.</p> <p>12 THE WITNESS: Per Les it appears it was being</p> <p>13 installed at that point.</p> <p>14 BY MR. TOBIN:</p> <p>15 Q Correct. Okay. And I don't think there's a dispute,</p> <p>16 but the bin that went down to Mexico that's being</p> <p>17 installed, that had air cannons with it, correct?</p> <p>18 A Per the e-mails, that's what it looks like, yes.</p> <p>19 Q And it's my understanding that you had no involvement</p> <p>20 with anyone about whether air cannons should or should</p> <p>21 not be on that bin that's being installed down in</p> <p>22 Mexico in late July of 2014, correct?</p> <p>23 A Correct.</p> <p>24 Q In fact, you're making that clear in <u>Exhibit 4</u> that you</p> <p>25 were not consulted prior to that particular bin being</p>	<p style="text-align: right;">Page 52</p> <p>1 Q But these particular accessories, the air cannons, that</p> <p>2 was of some concern for you, as expressed in <u>Exhibit 4</u>,</p> <p>3 right?</p> <p>4 A It was something that I had never -- never dealt with</p> <p>5 before.</p> <p>6 Q Correct. But if you look on page 2 towards the top,</p> <p>7 your e-mail back to Les, you are highlighting for Les a</p> <p>8 concern about air cannons and non-free-flowing product,</p> <p>9 correct?</p> <p>10 A Yes.</p> <p>11 Q And that further confirms that when you designed this</p> <p>12 bin -- and we talked about this -- that you were not</p> <p>13 contemplating soy meal, correct?</p> <p>14 A Again, it goes back to the math; that the same math is</p> <p>15 going to apply and that overpressure factor is going to</p> <p>16 account for the dynamic flow conditions of the</p> <p>17 commodities that would be placed in the hopper bin.</p> <p>18 Q Well, then explain that e-mail that we're looking at.</p> <p>19 Because you're telling Les that you're more concerned</p> <p>20 with eccentric loads that non-free-flowing materials</p> <p>21 could place on the hopper, right?</p> <p>22 A Yes.</p> <p>23 Q What are the eccentric loads that the non-free-flowing</p> <p>24 materials could place on the hopper? What could those</p> <p>25 be?</p>

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<p style="text-align: right;">Page 53</p> <p>1 A Again we're talking about the dynamic loads that would</p> <p>2 be associated with something that's non-free-flowing,</p> <p>3 but the math is still the same. You know, the</p> <p>4 overpressure factor you're going to apply should</p> <p>5 account for that, and when you apply a normal factor of</p> <p>6 safety, that hopper would be adequate for that</p> <p>7 application.</p> <p>8 Q I get it. I mean you've told me several times this</p> <p>9 morning that the use of soy meal doesn't seem to really</p> <p>10 alarm you today because the math is the same. You've</p> <p>11 stressed that to me. But in August of 2014 you were</p> <p>12 concerned about non-free-flowing grain being used in</p> <p>13 these hopper bins, correct?</p> <p>14 A Concerned from the standpoint it's -- it's a flow</p> <p>15 concern more than it is a structural design concern.</p> <p>16 Q What do you mean by that?</p> <p>17 A That they would have to be able to get the material in</p> <p>18 and out of the hopper.</p> <p>19 Q And is part of that the concern about bridging?</p> <p>20 A Yes.</p> <p>21 Q And at the end of that e-mail before the last sentence</p> <p>22 you're talking about the cannons helping to make the</p> <p>23 material flow better, but you say there is still reason</p> <p>24 for concern in my mind and then you say that you</p> <p>25 should -- that the size of the hopper should be</p>	<p style="text-align: right;">Page 55</p> <p>1 Q Okay. So how does the height-to-diameter ratio impact</p> <p>2 that?</p> <p>3 A Per Janssen's theory, the height-to-diameter ratio</p> <p>4 affects when you apply the overpressure factors to the</p> <p>5 structure.</p> <p>6 Q At what height-to-diameter ratio do you start to use</p> <p>7 something different than a 1.4?</p> <p>8 A It's different for the tank than it would be for the</p> <p>9 hopper cone. The hopper cone is 1.4.</p> <p>10 Q And is the whole point of this, we want to try to</p> <p>11 eliminate the prospects of bridging?</p> <p>12 Is that what you're telling Les in this e-mail;</p> <p>13 that if we can limit the size of these hoppers, we're</p> <p>14 going to limit the prospect of bridging?</p> <p>15 A You're trying to help facilitate the flow inside the</p> <p>16 hopper.</p> <p>17 Q And by facilitating flow inside the hopper, is that</p> <p>18 then trying to keep the material from bridging?</p> <p>19 A Yes.</p> <p>20 Q Because what we want to avoid is this material bridging</p> <p>21 and then coming loose and just free flowing straight to</p> <p>22 the bottom?</p> <p>23 MR. GOODSSELL: Object to the form and foundation</p> <p>24 of the question.</p> <p>25</p>
<p style="text-align: right;">Page 54</p> <p>1 limited.</p> <p>2 Is that what you're telling Les?</p> <p>3 I'm still at the top of page 2.</p> <p>4 A Yes.</p> <p>5 Q Why are you telling Les in August of 2014 that the size</p> <p>6 should be limited? What are you trying to address</p> <p>7 there?</p> <p>8 A That the flow conditions could be different with the</p> <p>9 soybean meal.</p> <p>10 Q Help me understand. How does size of bin relate to</p> <p>11 flow conditions?</p> <p>12 And some of this you may have to treat me almost</p> <p>13 like a 4th grader and help me understand what you're</p> <p>14 trying to communicate to me.</p> <p>15 How does the size of the bin impact or correlate</p> <p>16 or affect the flow conditions?</p> <p>17 A The height-to-diameter ratio can affect -- affect the</p> <p>18 design and how material flows within a bin.</p> <p>19 Q Okay. How?</p> <p>20 A The overpressure factors would be applied differently</p> <p>21 depending on the height-to-diameter. At a certain</p> <p>22 height-to-diameter -- the overpressure factors can be</p> <p>23 affected by the height-to-diameter ratio in the bin.</p> <p>24 Q How? We were using the 1.4.</p> <p>25 A Right.</p>	<p style="text-align: right;">Page 56</p> <p>1 BY MR. TOBIN:</p> <p>2 Q You can still answer.</p> <p>3 A Can you repeat the question?</p> <p>4 Q Sure. I mean, one thing that we're trying to prevent</p> <p>5 from a structural design perspective is we don't want</p> <p>6 this material to bridge and then free fall straight to</p> <p>7 the bottom?</p> <p>8 A We are trying to prevent bridging, yes.</p> <p>9 Q Because if it -- the bigger the diameter and the taller</p> <p>10 the tank means you can put more material in that</p> <p>11 tank -- or in that bin, correct?</p> <p>12 A Correct.</p> <p>13 Q And if there's more material in that bin, if it bridges</p> <p>14 and falls, there's the prospect for a larger piece of</p> <p>15 mass free falling to the bottom, correct?</p> <p>16 A Correct.</p> <p>17 Q And if a larger piece of mass is going to be free</p> <p>18 falling to the bottom, the potential catastrophic</p> <p>19 effects could be greater, correct?</p> <p>20 A Correct.</p> <p>21 Q Okay. To my knowledge there's nothing within</p> <p>22 engineering that you can factor in to account for this</p> <p>23 potential freefall of bridged material, is there?</p> <p>24 A There are no design standards that discuss that.</p> <p>25 Q Correct. We've been talking about the 1.4 factor.</p>



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<p>1 You can go ahead and answer.</p> <p>2 THE WITNESS: I think that if the correct bulk</p> <p>3 density is used, you arrive at a static -- static</p> <p>4 loads, you apply an overpressure factor to get your</p> <p>5 dynamic load pressures, and you apply the appropriate</p> <p>6 factor of safety per the design standards, that those</p> <p>7 hoppers should be fine.</p> <p>8 If there were problems with -- you know, with</p> <p>9 those hoppers, I think they would be making -- you</p> <p>10 know, trying to make changes to the design standards.</p> <p>11 I think there would be issues with the design</p> <p>12 standards.</p> <p>13 MR. O'MARA: Can we talk a minute?</p> <p>14 MR. TOBIN: Yeah, we'll take a little break.</p> <p>15 (Recess taken from 10:47 a.m. to 10:48 a.m.)</p> <p>16 BY MR. TOBIN:</p> <p>17 Q All right. I'm going to try to see if we can get</p> <p>18 common ground on this, and if not, then I'm going to</p> <p>19 move on.</p> <p>20 If you could look at <u>Exhibit 2</u>, the standard and</p> <p>21 the math that I think you're telling me about, is that</p> <p>22 the EP433 standard?</p> <p>23 A Yes.</p> <p>24 Q Will you agree with me that that standard by its own</p> <p>25 title concerns free-flowing grain?</p>	<p>1 bulk density.</p> <p>2 Q You never told KC Engineering that soy meal may be used</p> <p>3 because you didn't even think that soy meal would be</p> <p>4 used in July of 2012, correct?</p> <p>5 MR. GOODSSELL: Object to the form and foundation.</p> <p>6 You can go ahead and answer.</p> <p>7 THE WITNESS: Not necessarily. We don't know what</p> <p>8 commodities -- you know, a lot of different commodities</p> <p>9 are placed in hoppers.</p> <p>10 BY MR. TOBIN:</p> <p>11 Q Back to <u>Exhibit 4</u>, the e-mails you're having with Les</p> <p>12 in August of 2014.</p> <p>13 Why, on the second page -- I just want to ask one</p> <p>14 more time, and then we'll get to the first page -- but</p> <p>15 why are you telling Les that you should limit the size</p> <p>16 of these hoppers?</p> <p>17 A It's a new design, and we're rolling out a new product,</p> <p>18 and there's some uncertainty with something that</p> <p>19 you're, you know, not completely familiar with. But,</p> <p>20 again, if everything is done per the design standards,</p> <p>21 there really should be, you know, no problems with the</p> <p>22 design.</p> <p>23 Q And then on the first page of <u>Exhibit 4</u> -- well, in the</p> <p>24 e-mail that starts at the bottom of page 1 and goes on</p> <p>25 to page 2, Les is telling you that the bin that is</p>
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<p>1 A Yes.</p> <p>2 Q Is soy meal a free-flowing grain? Is soy meal a</p> <p>3 free-flowing material?</p> <p>4 A It's not a free-flowing grain.</p> <p>5 Q Is it a free-flowing material?</p> <p>6 A There are differing opinions out there. There's data</p> <p>7 out there to support either way. I mean grains can be</p> <p>8 non-free-flowing in certain conditions as well. There</p> <p>9 are cases out there showing that soybean meal,</p> <p>10 you know, really flows no differently in certain cases</p> <p>11 than grains.</p> <p>12 Q So you -- okay. You'll agree with me, though, that if</p> <p>13 soy meal is not a free-flowing material, then your</p> <p>14 reference to EP433 would be incorrect?</p> <p>15 A It comes back to the design standard that we use and</p> <p>16 that KC used as well to check our work; that if you</p> <p>17 design that static load case and you apply the</p> <p>18 overpressure for those dynamic loads, per the standard</p> <p>19 you apply the appropriate factor of safety that you --</p> <p>20 you know, ultimately we're trying to arrive at a safe</p> <p>21 product.</p> <p>22 Q You'll agree with me that Sioux Steel never informed</p> <p>23 KC Engineering that soy meal may be used in these</p> <p>24 hopper bins, correct?</p> <p>25 A We didn't discuss specific commodities. We discussed a</p>	<p>1 being installed in Mexico is the 30-foot diameter,</p> <p>2 correct?</p> <p>3 A He's saying the hopper is a 3012, yes.</p> <p>4 Q Correct. And that correlates with the 30-foot</p> <p>5 diameter?</p> <p>6 A Yes.</p> <p>7 Q Okay. And then in your next e-mail you're recommending</p> <p>8 that only 10 rings should be the limit on a 30-foot</p> <p>9 hopper?</p> <p>10 A Yes.</p> <p>11 Q Do you know as you sit here how many rings were on the</p> <p>12 one that was in Mexico that failed?</p> <p>13 A 12 rings.</p> <p>14 Q Are the rings -- does that control the height of the</p> <p>15 bin?</p> <p>16 A Yes.</p> <p>17 Q How many feet are on a ring?</p> <p>18 A 44 inches, so 3.67 feet.</p> <p>19 Q So you're telling him that ideally -- well,</p> <p>20 strike that.</p> <p>21 You're telling Les that 10 rings should be the</p> <p>22 limit on a 30-foot hopper?</p> <p>23 A Yes.</p> <p>24 Q Do you still agree with yourself today, or have you</p> <p>25 changed your thought since August of 2014?</p>



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<p style="text-align: right;">Page 81</p> <p>1 MR. TOBIN: Correct.</p> <p>2 MR. GOODSSELL: Okay.</p> <p>3 Would this be a good time for me to take a coffee</p> <p>4 break --</p> <p>5 MR. TOBIN: Absolutely.</p> <p>6 MR. GOODSSELL: -- or a break because of coffee?</p> <p>7 MR. TOBIN: Sure.</p> <p>8 (Recess taken from 11:20 a.m. to 11:35 a.m.)</p> <p>9 BY MR. TOBIN:</p> <p>10 Q Chad, I want to talk a little bit about the work -- the</p> <p>11 remedial work that was done at the Veracruz bin that we</p> <p>12 were just talking about.</p> <p>13 What is different -- I know you said that they</p> <p>14 replaced the hopper panels. What's different about</p> <p>15 them? For example, is it still a 45-degree angle, or</p> <p>16 did it go to a different angle?</p> <p>17 A Hopper angle is the same at 45 degrees.</p> <p>18 Q Are there more bolts, or is it still a single line?</p> <p>19 A There were additional bolts placed in the panels, and</p> <p>20 the edge distance from the bolts to the edge of the</p> <p>21 panel was increased.</p> <p>22 Q Were thicker panels used?</p> <p>23 A Yes.</p> <p>24 Q How much thicker? Do you know what it went -- from</p> <p>25 what to what?</p>	<p style="text-align: right;">Page 83</p> <p>1 Q I mean do you know if it's even any?</p> <p>2 A We have sold hopper bins post failure, yes.</p> <p>3 Q You just don't know how many?</p> <p>4 A Correct.</p> <p>5 Q Do you know if any of those went to Mexico or somewhere</p> <p>6 in a hot, humid climate?</p> <p>7 A I don't know.</p> <p>8 Q Post failure I believe the only communications that I</p> <p>9 have would be this e-mail string <u>Exhibit 1</u>, okay, and</p> <p>10 what I want to ask some questions about is if you</p> <p>11 recall any conversations with Les about this bin and</p> <p>12 the failure other than what's on <u>Exhibit 1</u>.</p> <p>13 A I don't recall any conversations.</p> <p>14 Q What about with Chris?</p> <p>15 A He and I would have had conversations post failure,</p> <p>16 yes.</p> <p>17 Q Do you recall those discussions as you sit here now?</p> <p>18 A Yes.</p> <p>19 Q What do you recall?</p> <p>20 A The day after the failure, when they sent pictures and</p> <p>21 I was able to look at the pictures and immediately drew</p> <p>22 a conclusion to what I thought was, you know, maybe the</p> <p>23 failure mode and went into the design and figured out</p> <p>24 the math error on the spreadsheet that resulted in the</p> <p>25 utilization ratios being much higher than what we</p>
<p style="text-align: right;">Page 82</p> <p>1 A I don't recall off the top of my head.</p> <p>2 Q Any other differences that you can think of?</p> <p>3 A No.</p> <p>4 Q Did you go redesign and reengineer that, or did you go</p> <p>5 back to <u>Exhibit 5</u>, your old work, and just use</p> <p>6 different -- you know, plug in information at that</p> <p>7 level?</p> <p>8 A Plugged in different information to the spreadsheet</p> <p>9 that designed the vertical joints in the hopper cone.</p> <p>10 Q Do you still have those in your office?</p> <p>11 A Yes.</p> <p>12 Q Would you be able to get those to the attorneys, a copy</p> <p>13 of that?</p> <p>14 A Yes.</p> <p>15 Q If you know, pre-failure it sounds like Sioux Steel</p> <p>16 sold only two of the hopper bins.</p> <p>17 Would that sound right?</p> <p>18 A Boy, I don't know for sure.</p> <p>19 Q And the only reason I say that is because it sounds</p> <p>20 like to your knowledge they've only gone back to do</p> <p>21 remedial work on one.</p> <p>22 A Correct.</p> <p>23 Q Do you have any idea of how many hopper bins have been</p> <p>24 sold post failure?</p> <p>25 A I don't have a number, no.</p>	<p style="text-align: right;">Page 84</p> <p>1 originally thought they were on those vertical bolted</p> <p>2 seams.</p> <p>3 Q So you discovered that mathematical error the day after</p> <p>4 the failure?</p> <p>5 A Yes.</p> <p>6 Q And you discussed that with Chris?</p> <p>7 A Yes.</p> <p>8 Q Have you discussed that failure with anyone else at</p> <p>9 Sioux Steel outside of Ms. Ellis or Mr. Goodsell?</p> <p>10 A Yes.</p> <p>11 Q Who else have you discussed it with?</p> <p>12 A Scott Rysdon, the CEO.</p> <p>13 Q On more than one occasion?</p> <p>14 A We've met multiple times, yes.</p> <p>15 Q Did you inform Mr. Rysdon of the mathematical error on</p> <p>16 the vertical seam?</p> <p>17 A Yes.</p> <p>18 Q One of the engineering consultants who has been out</p> <p>19 there I think goes by ESI.</p> <p>20 Have you seen a copy of ESI's report?</p> <p>21 A Yes.</p> <p>22 Q Have you reviewed that report?</p> <p>23 A Yes.</p> <p>24 Q Did you speak with anyone at ESI?</p> <p>25 A I did not.</p>

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1 Q Did you play any role in furnishing documents or  
2 information to ESI?  
3 A We didn't provide them any documents prior to their  
4 report coming out.  
5 Q And I don't have a copy of it with me, and I can grab  
6 it if we need to, but in the ESI report they have  
7 copies of some of KC Engineering's documents that were  
8 forwarded to you with their August report, and I'm  
9 wondering: Do you have any idea as to how ESI would  
10 have gotten their hands on that information?  
11 A We must have provided that information.  
12 Q Correct. I understand things are happening at  
13 different levels, and I understand that you're not in  
14 charge of all that. But I'm just wondering if you were  
15 tasked with putting together information to get to ESI.  
16 A No.  
17 Q When I read the ESI report, I didn't see anywhere any  
18 discussion about Sioux Steel's design error on those  
19 vertical panels.  
20 Did you see anything in the ESI report discussing  
21 Sioux Steel's design error?  
22 A I don't recall.  
23 Q And I don't believe in the documents referenced by ESI  
24 that they ever had a copy of your work file, which has  
25 been marked Exhibit 5.

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1 Do you recall them discussing anything from your  
2 work file, Exhibit 5, in their report?  
3 A I do not.  
4 Q I know you told me that you discussed the mathematical  
5 error with Chris and Scott.  
6 Did you ever provide a copy of your work papers,  
7 Exhibit 5, to either Chris or Scott?  
8 A I would have had them in hand when we met, yes.  
9 Q Do you have any recollection of giving them a copy or  
10 them retaining a copy.  
11 A I don't remember. Typically they don't keep stuff like  
12 that. I mean I have all that information. So -- I  
13 don't recall for sure whether or not they have a copy.  
14 Q From your perspective, what did KC Engineering do  
15 wrong?  
16 A They failed to analyze the vertical joint in the hopper  
17 panels that ultimately failed on the hopper down in  
18 Mexico.  
19 Q Is there anything else?  
20 A No. Ultimately that's what it comes down to.  
21 Q From your perspective who is more at fault, Sioux Steel  
22 for the design error or my client for what you contend  
23 they did wrong?  
24 MR. GOODSSELL: I'm going to object to the form and  
25 foundation of the question. This is a legal issue, and

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1 he's instructed not to answer.  
2 BY MR. TOBIN:  
3 Q I'm going to give you a chance to answer the question.  
4 He may not let you, but I'm going to let you know that  
5 if we have to have this in front of a judge, we'll be  
6 back together again for an opportunity for you to  
7 answer that question.  
8 MR. GOODSSELL: Court Reporter, would you read it  
9 back again, please.  
10 (The record was read by the reporter as follows:  
11 Question: "From your perspective who is more at  
12 fault, Sioux Steel for the design error or my client  
13 for what you contend they did wrong?")  
14 MR. GOODSSELL: Okay. I'm going to reassert the  
15 objection and instruct you to go ahead and answer.  
16 THE WITNESS: Sioux Steel is responsible for our  
17 product and for the design of our product, but I don't  
18 feel that we're responsible for the failure. We  
19 designed our product per design standards, applied the  
20 appropriate factor of safety, and sent it out to be  
21 vetted, to be -- to have that additional step of safety  
22 there.  
23 So, again, I feel that, you know, we are  
24 responsible -- we own up to -- you know, I made a  
25 mistake. Sioux Steel is responsible for their product,

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1 but we sent out this design to be vetted so that  
2 something -- you know, a failure like this would not  
3 happen.  
4 BY MR. TOBIN:  
5 Q So you place responsibility for the event in Mexico on  
6 whom?  
7 MR. GOODSSELL: Again I'm going to object to the  
8 form and foundation of the question.  
9 You may go ahead and answer.  
10 THE WITNESS: Ultimately, the design was missed by  
11 both people. I mean, I made the mistake. Again, I own  
12 up to that. There was a math error in the design  
13 spreadsheet. And we sent it out to be vetted, and it  
14 didn't get -- it didn't get caught. So there's  
15 responsibility on both parties.  
16 BY MR. TOBIN:  
17 Q Do you think there's any responsibility or fault on  
18 yourself for not providing Exhibit 5 to KC Engineering?  
19 A I would say no. I haven't really considered it before  
20 today honestly.  
21 Q Do you think there's any fault or responsibility on you  
22 for not thoroughly going through what KC Engineering  
23 sent to you at the end of August 2012?  
24 A I don't because, you know, we sent it out to be  
25 reviewed by them, you know. We aren't reviewing their

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<p style="text-align: right;">Page 89</p> <p>1 work; they're reviewing our work is how I look at it.</p> <p>2 Q Let's talk a bit about Mr. Nohr. We chatted about him</p> <p>3 and his report a bit ago. Just to set the stage -- not</p> <p>4 to kind of rehash, but just to set the stage: Mr. Nohr</p> <p>5 believes that the mechanism of failure started at the</p> <p>6 bottom of the hopper cone, correct?</p> <p>7 I'm not asking you to agree with him, but</p> <p>8 that's -- you understand that's what Mr. Nohr's</p> <p>9 conclusion is?</p> <p>10 A Correct.</p> <p>11 Q Okay. And I think you told me that per the math the</p> <p>12 failure should have started further up in the hopper</p> <p>13 cone, towards the top of the hopper cone?</p> <p>14 A Correct.</p> <p>15 Q And I just want to flesh some of that out and make sure</p> <p>16 I understand what you're thinking.</p> <p>17 You said you didn't see the video of the event?</p> <p>18 A I did not.</p> <p>19 Q Is the sole basis for your disagreement with Mr. Nohr</p> <p>20 the math that it's overstressed at the 27-foot</p> <p>21 diameter? Is that the basis for your disagreement with</p> <p>22 Mr. Nohr's conclusion that it actually started at the</p> <p>23 bottom?</p> <p>24 A Yes.</p> <p>25 Q Have you ever spoken with Mr. Nohr in any respect about</p>	<p style="text-align: right;">Page 91</p> <p>1 where it started, okay, if you can just mentally accept</p> <p>2 that for me -- and we've already looked in <u>Exhibit 5</u></p> <p>3 that at the 4-foot diameter the utilization ratio is</p> <p>4 good, correct?</p> <p>5 A Correct.</p> <p>6 Q So what I want to ask just to gauge your reaction is:</p> <p>7 If Mr. Nohr is correct that the failure began at the</p> <p>8 bottom of the hopper cone where the math says there is</p> <p>9 no mistake, wouldn't that failure mean that Sioux Steel</p> <p>10 is not responsible, nor is KC Engineering responsible?</p> <p>11 MR. GOODSSELL: I'm going to object to the form and</p> <p>12 foundation of the question.</p> <p>13 You can go ahead and answer.</p> <p>14 THE WITNESS: After reading Nohr's report and</p> <p>15 comparing it to what we were looking at in the design</p> <p>16 calculations, we struggled to make sense of why that --</p> <p>17 why he would have come to that conclusion, and it</p> <p>18 didn't make sense with the math.</p> <p>19 BY MR. TOBIN:</p> <p>20 Q And I appreciate that, but I'm asking you to set that</p> <p>21 aside and if Nohr is right -- I know it disagrees with</p> <p>22 the math that you have.</p> <p>23 A Right.</p> <p>24 Q Okay. But if Nohr is right and the failure began at an</p> <p>25 area where it says it shouldn't fail, wouldn't that</p>
<p style="text-align: right;">Page 90</p> <p>1 that failure down in Mexico or his report?</p> <p>2 A I have not.</p> <p>3 Q Did you ever communicate your disagreement with</p> <p>4 Mr. Nohr's conclusion to anyone at Sioux Steel?</p> <p>5 A I don't recall for sure. We had multiple conversations</p> <p>6 about it, but I don't know if we specifically discussed</p> <p>7 disagreement with Nohr's report.</p> <p>8 Q To your knowledge has anyone asked Mr. Nohr -- from</p> <p>9 Sioux Steel -- about that conclusion of it starting at</p> <p>10 the bottom and how he arrived at that?</p> <p>11 A I'm sorry. Can you repeat that question?</p> <p>12 Q Well, maybe -- you haven't been involved in any</p> <p>13 discussions with Mr. Nohr about his report?</p> <p>14 A I have not.</p> <p>15 Q And to your knowledge no one has taken your concern</p> <p>16 with Mr. Nohr's conclusion back to Mr. Nohr?</p> <p>17 A Not to my knowledge.</p> <p>18 Q Did you ever assemble any documents to provide to</p> <p>19 Mr. Nohr?</p> <p>20 A I did not.</p> <p>21 Q If Mr. Nohr is correct -- and I know you disagree with</p> <p>22 that, so I'm kind of asking you to make a mental leap</p> <p>23 that you don't want to do. But hypothetically</p> <p>24 speaking, if Mr. Nohr is correct that the mechanism of</p> <p>25 failure was at the bottom of the hopper cone, that's</p>	<p style="text-align: right;">Page 92</p> <p>1 mean that Sioux Steel did nothing wrong and</p> <p>2 KC Engineering did nothing wrong; maybe it's the</p> <p>3 standard?</p> <p>4 A I agree that could be the case.</p> <p>5 MR. TOBIN: Why don't we take another break. We</p> <p>6 may be nearing the end.</p> <p>7 (Recess taken from 11:55 a.m. to 12:11 p.m.)</p> <p>8 BY MR. TOBIN:</p> <p>9 Q Chad, I'm almost done.</p> <p>10 I want to go back to <u>Exhibit 5</u>, which would be</p> <p>11 your design documents, and specifically that page 1376</p> <p>12 on the vertical seams, and what I want to try to get a</p> <p>13 better understanding of is -- you've referred to the</p> <p>14 mistake as a mathematical error in your testimony, and</p> <p>15 I want to get a sense as to what that means.</p> <p>16 This document, this page 1376, that comes from an</p> <p>17 Excel spreadsheet, correct?</p> <p>18 A Yes.</p> <p>19 Q And you would have been the one who built that</p> <p>20 spreadsheet?</p> <p>21 A Yes.</p> <p>22 Q And you would have been the one who would have inputted</p> <p>23 the formulas into the necessary cells?</p> <p>24 A Yes.</p> <p>25 Q Is the mistake that you put an incorrect formula into</p>